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EXAMINER

DINH, DUC Q

ART UNIT

PAPER NUMBER

2629

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

1. This Office Action is responsive to the Application filed on November 21, 2003. Claims 1-11 are currently pending in the Application and being examined.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1, recites the limitation "said positioning device" in line 7.

Claim 7, recites the limitation "said pointing device" in line 1.

There are insufficient antecedent basis for recited limitations in the claims.

3. Claim 3 is objected to because of the following informalities: "laser" in lines 1 and 2 should read, "laser diode". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adan et al. (6,172,354), hereinafter Adan, in view of Jung et al. (US 2002/0139918 A1), hereinafter Jung.

In reference to claim 1, Adan discloses pointing device (mouse 40 in Fig. 2) comprising:

an illumination system (LED 104, lens 108) that illuminates a surface (116) over which said pointing device (40) moves, said illumination system (104 Fig. 2; light source 104 includes LED 118 and lens 120. Radiation emitted from an LED 118 is transmitted through lens 120 such that it passes through aperture 106 in housing 102 and impinges upon work surface 116; col. 4, lines 56-59) generating a light level determined by an illumination control signal (controller 112 intermittently senses the intensity of the radiation generated by source 104 through current driver 114 and provide control signal to the light source 104 to adjust the intensity of the light source 104; col. 5, lines 52-54);

a camera system (108, 110; the light then reflects off of work surface 116 toward lens 108. Lens 108 collects the radiation reflected from surface 116 and directs it to image detector e.g., artificial retina 110; col. 4, lines 60-65) that records a plurality of images (col. 5, lines 15-20) of said illuminated surface (116)

a controller (112) that records first and second images taken by said camera at different times and determines a displacement indicative of the direction and distance said positioning device moved between said two different times (col. 6, lines 34-51; Fig. 4), said controller further generating said illumination control signal (controller 112 intermittently senses the intensity of the radiation generated by source 104 and adjusts the current provided to source 104 through current driver 114; col. 5, lines 50-62)

Accordingly, Adan discloses everything except said illumination control signal depending on at least one of said images recorded by said camera system. Jung discloses a photo image detector using for a photo mouse (Fig. 3; paragraph [0004]) and method of controlling luminous intensity of light source (50) having a image processor (55) using at least one of the

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images recorded by the camera system (52) to generate a illumination control signal for controlling a luminous intensity of the illumination system (50; paragraph [0020] and claim 1 of Jung) as claimed.

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify the controller of Adan to enable to use one of the image from the recorded images to generate a illumination control signal to control the luminous intensity of the illumination system as taught be Jung because it would enhance the quality of the image of an object and reduces a consumption of a power supply by adjusting directly the luminosity of the light source [paragraph 0044 of Jung];

In reference to claim 4, Adan discloses said illumination system comprises an LED and variable current circuit (114 in Fig. 2) that adjusts the current flowing through said LED in response to said illumination control signal (controller 112 intermittently senses the intensity of the radiation generated by source 104 and adjusts the current provided to source 104 through current driver 114; col. 5, lines 50-54).

In reference to claim 7, Adan discloses a method for determining the displacement (movement of mouse 40) of a pointing device (40) on a surface (116), said method comprising:

illuminating (by light source 104) said surface (116) with a light level determined by an illumination control signal (controller 112 intermittently senses the intensity of the radiation generated by source 104 and adjusts the current provided to source 104 through current driver 114; col. 5, lines 50-6);

recording a plurality of images (identify different patterns and store patterns; Fig. 4) of said illuminated surface; and

comparing first and second images taken at different times to determine a displacement indicative of the direction and distance said positioning device moved between said two different times (based on the movement detected, controller 112 provides position information to the system; col. 6, lines 34-51; Fig. 4A).

Accordingly, Adan discloses everything except said illumination control signal depending on at least one of said recorded images. Jung discloses a photo image detector using for a photo mouse (Fig. 3; paragraph [0004]) and method of controlling luminous intensity of the light source therefor having a image processor (55) using at least one of the images recorded by the camera (52) system to generate a illumination control signal for controlling a luminous intensity of the illumination system (50 Fig. 3; paragraph [0020]) as claimed.

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify the controller of Adan to enable to use one of the image from the recorded images to generate a illumination control signal to control the luminous intensity of the illumination system as taught be Jung because it would enhance the quality of the image of an object and reduces a consumption of a power supply by adjusting directly the luminosity of the light source [paragraph 0044 and claim 1 of Jung];

In reference to claim 9, Adan discloses said illumination system comprises an LED and variable current circuit (114 in Fig. 2) that adjusts the current flowing through said LED in response to said illumination control signal (controller 112 intermittently senses the intensity of the radiation generated by source 104 and adjusts the current provided to source 104 through current driver 114; col. 5, lines 50-54).

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6. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adan in view of Jung as applied to claims 1, 4, 7 and 9 above and further in view of Norskog (U.S Patent No 6,585,158).

In reference to claim 2 and 8, Adan disclose the surface 116 is reflective (col. 4, lines 60-63) and Jung reflective surface (51 [0033]); however, the combination of Adan and Jung does not discloses said light level generated by said illumination system is inversely related to said reflectivity. Norskog discloses optical mouse having a light source 102 provides a source light 102 that illuminate reflective surface (104 in Fig. 1) and the light generated by said illumination system is inversely related to said reflectivity (in addition to turning the light on or off, the light source signal line 102 can also control the intensity of the light source. If the mouse were on bright white paper, the light intensity can be reduced as compared to the intensity it might be set at if it's used on paper that is less reflective; col. 4, lines 50-55).

It would have been obvious for one of ordinary skill in the art at the time of the invention to learn the teaching of Norskog, i.e. reducing the intensity of the light source (illumination system) on white surface (high reflective surface) and increase the light intensity on less reflective surface, in the combination of Adan and Jung because it would provide a light source that illuminates on demand to reduces a consumption of a power supply by adjusting the intensity of the light source as needed.

7. Claims 5 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Adan and Jung as applied to claims 1, 4, 7 and 9 above, and further in view of Fujiwara (U.S Patent No. 5,608,339).

In reference to claim 5 and 10, Adan discloses the variable current circuit 114 for the system. The combination of Adan and Jung does not disclose said variable current circuit comprises a current mirror for controlling the current in said LED. Fujiwara discloses current mirror (12 in Fig. 1) for controlling the current in an LED (1; Fig. 1; col. 4, line 33-43) .

It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the current mirror circuit using for controlling current in LED in the combination of Adan and Jung as discloses by Fujiwara because it would provide operating current with high speed responsiveness (col. 11, lines 19-22).

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adan and Jung as applied to claims 1, 4, 7 and 9 above, and further in view of Hedman (U.S Patent No 6,496,180).

In reference to claim 3, Adan discloses said illumination system comprises an LED and variable current circuit (114 in Fig. 2) that adjusts the current flowing through said LED in response to said illumination control signal (controller 112 intermittently senses the intensity of the radiation generated by source 104 and adjusts the current provided to source 104 through current driver 114; col. 5, lines 50-54). However, the combination of Adam and Jung does not disclose the illumination system comprises a laser diode for emitting light. Featherstone discloses a computer optical mouse having a light emitter element which may be an LED or laser diode (45; Fig. 3, 4; col. 2, lines 50-53 of Hedman).

It would have been obvious for one of ordinary skill in the art at the time of the invention to recognize the use of laser diode (or LED) as light emitting element for optical mouse is widely use as discloses by Hedman (45; Fig. 3, 4; col. 2, lines 50-53 of Hedman).

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9. Claim 6 and 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adan and Jung as applied to claims 1, 4, 7 and 9 above, and further in view of Pranger et al. (U.S Patent No. 5,574,480), hereinafter Pranger.

In reference to claim 6, the combination of Adan and Jung does not disclose the illumination system has first setting for providing a first level of accuracy in said determined displacement and a second setting for providing a second level of accuracy that is greater than said first accuracy, said second illumination setting requiring more power than said first illuminating setting, said illumination setting being determined by a control signal supply by a user of said pointing device. Pranger discloses a computer pointing device (mouse 18; Fig. 3) having an illumination system (LED 120) and controller 130 is able to provide discrete drive currents to LED 120 in order to provide different illumination levels. Controller 13 select the middle current intensity level as the default level, the middle intensity is the normal operating level, i.e. first level of accuracy in determining the accuracy of the mouse displacement (col. 6, lines 32-36). After a prolonged use, the intensity of the LED 120 at the normal level is reduced, in order to ensure sufficient signal to noise ratios for the reflected light received by the detector, a user configures RPD to use the high level current level, i.e. high current level for second intensity setting requiring more power than normal current level for the middle intensity at normal current level and the second intensity is determined by a control signal supplied by a user (col. 6, lines 50-56).

It would have been obvious for one of ordinary skill in the art at the time of the invention to learn the teaching of Pranger, i.e.: setting different intensity level for the illumination system (LED 12) having a first setting at normal current level as default level and second intensity for

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the illumination system after prolonged of use with high current level, in the combination of Adan and Jung because it would provide a simple, efficient solution to a problem of configuring computer pointing devices, and to improve computer pointing device performance and reliability (col. 6, line 66-67, col. 7, lines 1-2 of Pranger).

In reference to claim 11, Pranger discloses a light level (intensity level of the LED 120) is also determined by a control signal (user reconfigures RPD 18 to use the high current level) that is input by a user of said pointing device (col. 6, lines 50-56 of Pranger and the rejection as applied to claim 6).

It would have been obvious for one of ordinary skill in the art at the time of the invention to learn the teaching of Pranger, i.e. providing user input signal to set the intensity level of the LED in the device of Adan and Jung because it would improve performance and reliability of the mouse after performance degradation of the LED (col. 6, lines 55-58 of Pranger).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUC Q DINH whose telephone number is (571) 272-7686. The examiner can normally be reached on Mon-Fri from 8:00.AM-4:00.PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe can be reached on (571) 272-7691. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUC Q DINH
Examiner
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A handwritten signature in black ink, appearing to read 'Duc Dinh', written over the printed name.

DQD
May 13, 2006